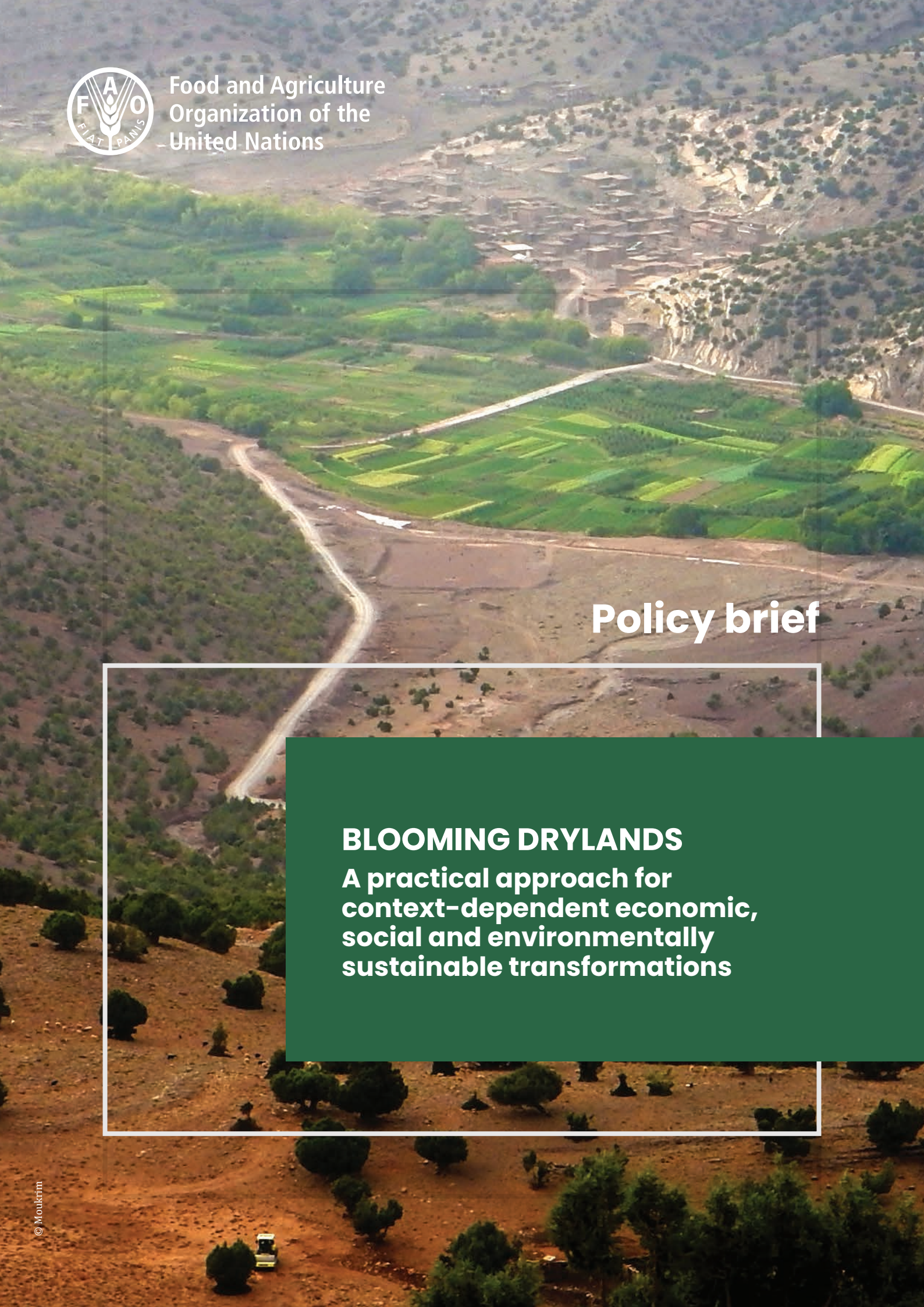

Food and Agriculture Organization of the United Nations

Policy brief

BLOOMING DRYLANDS

A practical approach for context-dependent economic, social and environmentally sustainable transformations

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This policy brief is intended to inform decision-makers of nine transformational actions to sustain dryland production systems under the impact of climate change. It highlights the relevance of the local context for interventions and the importance of traditional and tested adaptive agrosilvopastoral strategies for building resilience. In addition, it emphasizes the potential for scaling up and using complementary technologies over wider areas. In particular, the roles of both women and men should not be neglected in terms of maintaining, creating and restoring dryland sustainable landscapes.

Local trees and their management can play a major role in supporting livelihoods and agriculture – and their interconnected economic, social and environmental value should not be underestimated in these areas.

The transformational approach set out here relies on the extensive knowledge and lessons learned by both local people, as well as dryland forest and agrosilvopastoral experts in many different contexts.

Transformation is a must in drylands and their agrosilvopastoral systems to achieve the 2030 Agenda

In many drylands, trees benefit agriculture in a myriad of ways, including, among others, enhancing soil fertility, water retention, reducing erosion, providing shade, windbreaks and fodder, and supporting a variety of agrosilvopastoral livelihoods. As such, these benefits have enabled local communities to adapt to extreme environments, which has been in part possible due to a rich heritage of knowledge. Nevertheless, new technology can complement traditional practices and contribute to a broader understanding of these drylands in positive ways.

> It is projected that four billion people will be living in the world's drylands by 2050. Comprising 41 percent of the global land area, supporting more than half of the world's livestock and hosting 27 percent of the world's forests and woodlands – they are currently home to 2.7 billion people – most of whom are in developing countries.

Climate warming in drylands is currently twice the global average and compounded crises are on the rise in these regions. This is demonstrated by the ongoing impacts of the COVID-19 pandemic in areas where droughts, floods, locust swarms, conflicts and other factors have recently devastated livelihoods. To address these challenges, there is an urgent need for transformational change in the management of drylands and their associated agrosilvopastoral systems to ensure that they continue to provide critical goods and services to dryland communities. As a result, this will help in contributing to food security and healthy livelihoods, but at the same time protecting and restoring biodiversity. Additional benefits include enhancing soil fertility and increasing carbon storage in soils and biomass.

The transformational approach

Transformational approach for dryland production systems under climate change

Guided by the 10 elements of agroecology, FAO's common vision for sustainable food and agriculture goes hand in hand with global efforts such as the UN Decade on Ecosystem Restoration (2021–2030), which aims to prevent, halt and reverse degradation of ecosystems worldwide in order to help end poverty, combat climate change and prevent a mass extinction.

Sustainable development can be defined as the organizing principle for meeting human development goals, while simultaneously sustaining the ability of natural systems to provide the natural resources and ecosystem services on which the economy and society depend. In the approach set out here, both rely on the fact that the three sustainability pillars are interconnected. Each of the three sustainability pillars illustrates three expected transformations (i.e. nine transformations in total) through different interventions. In general, the approach is founded on successful examples and initiatives on the ground to achieve the proposed transformations.

Economic sustainability pillar

Given current and future challenges, the transition towards sustainable food and other production systems in drylands requires investment and an enabling policy environment for interventions. Transformational results can be expected if these interventions are co-created with local communities and based on the principles of accountability, equity, transparency, and the rule of law. The proposed expected transformations to guide such interventions are outlined below.

EXPECTED TRANSFORMATION 1 INVESTMENT: *Increased investment in sustainable dryland production systems and associated livelihoods through the collaboration of government, the private sector and others.*

Given climate change and variability, the most significant opportunities to feed and supply natural resources to a rapidly growing population rely on the economic, social and environmental benefits from sustainable intensification of production in existing pastures, forests and croplands. In practice, this entails creating enabling conditions for the management of environmental and economic risk factors, and for the adoption of the most appropriate practices. This approach is often derived from traditional knowledge, as well as technological innovation, to obtain maximum possible yields. Leveraging private sector investments to increase financial opportunities for sustainable production systems is crucial.

EXPECTED TRANSFORMATION 2 SCALABLE VALUE CHAINS: *Scaled up sustainable dryland product value chains.*

There is a need for adaptive capacities in the different value chains to provide the basis of climate-resilient and sustainable economic development, but investments are required. Interventions that contribute to the achievement of this expected transformation include those related to strengthening existing, and supporting the development of new value chains, as well as targeting current limiting factors. However, the costs of scaling up profitable production systems based on natural resources and the lives and livelihoods of the local communities need to be taken into consideration to avoid maladaptive outcomes.

EXPECTED TRANSFORMATION 3 CLIMATE RISK INSURANCE: *Guaranteed equal and inclusive access to climate risk insurance mechanisms for dryland agrosilvopastoral system-dependent populations.*

Insurance is a crucial tool for providing the flow of capital to support communities and infrastructure in order to recover from disasters. Without adequate insurance, the burden of paying for losses falls mostly on individuals, governments or aid organizations, resulting in significant impacts on already strained national budgets, and economic and social hardships for those affected, often the most vulnerable communities.

The benefits of insurance go beyond compensation and recovery. Insurance systems can contribute broader resilience to climate-related risks by helping promote measures that individuals and communities can use to improve their protection. Therefore, it is important to design insurance products that respond to local needs and address the differences between women and men, are affordable to beneficiaries and insurance companies, and can strengthen the public–private partnerships. Nevertheless, formal insurance schemes should not replace or undermine traditional coping mechanisms.

Expected transformation under the economic pillar

1 INVESTMENT

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In **India** , the green revolution that began 50 years ago strengthened the role of the private sector, resulting in positive effects on agriculture and dryland farming value chains, which contributed to the poverty headcount ratio declining at the national poverty line from 45.3 percent in 1993 to 21.9 percent in 2011 (World Development Indicators, World Bank, https://data.un.org/Search.aspx?q=india+poverty+line&t=Data).

2 SCALABLE VALUE CHAINS

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Most African countries are particularly dependent on charcoal as a fuel, both for rural and urban populations. Potentially, USD 1.5–3.9 billion could be reinvested in greening the charcoal value chain from annual revenue currently lost due to lack of regulation in the sector.
See: www.fao.org

3 CLIMATE RISK INSURANCE

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In **Kenya**, CARE International supported the successful pilot-testing of an index-based livestock micro-insurance scheme for migratory pastoralists. This initiative has contributed to the rolling out of a government-sponsored, large-scale insurance programme.
See: www.insuresilience.org

Social sustainability pillar

Over the past three decades, there has been a shift in policy narrative towards an increased understanding of dryland contexts. The change has focused on human and social capital, the need for increasingly integrating local knowledge, targeted development needs, informed participation, and inclusion of customary/local institutions as a means of ensuring that interventions respond to the dryland contexts. Where communities are part of the broader development discourse, positive impacts have been widely noted, with associated benefits in food security, health and nutrition.

EXPECTED TRANSFORMATION 4 EQUITY: *Improved social well-being and equity for dryland forest and agrosilvopastoral system-dependent livelihoods.*

The extent to which people have secure and equitable access to social services, and to the natural resources they need to produce food for their consumption and nutrition and to generate income, plays a critical role in land management and the sustainable development of rural areas. For many agrosilvopastoral system-dependent communities in drylands, insecure tenure rights over natural resources or inadequate and inequitable access to them results in extreme poverty and hunger.

By securing access to resources and providing land tenure opportunities, farmers can make better and more sustainable land management investments. As such, this can result in enhancing food production, food security, and improving their quality of life. Furthermore, by recognizing the role that local institutions and collectives contribute to managing dryland resources, helps ensure the sustainability of food production systems in these areas.

EXPECTED TRANSFORMATION 5 DISASTER RISK MANAGEMENT: *Protecting the lives and livelihoods of dryland agrosilvopastoral system-dependent populations against climate shocks, disasters and conflicts.*

Direct and indirect climate change impacts on drylands will test the resilience of their populations, natural resources and food production systems. However, coping strategies based on traditional knowledge should never be ignored or underestimated. Nevertheless, without appropriate adaptation measures in place, the capacity of rural populations to cope with and recover will decrease, causing potentially dire socio-economic consequences.

By increasing awareness and understanding of linkages between short- and long-term climate trends, land degradation and resource scarcity, and offering and expanding access to climate information and early warning systems, can have many benefits. As a result, for example, households can become empowered to make investment decisions that enhance and protect their livelihoods and reduce vulnerability to shocks.

EXPECTED TRANSFORMATION 6 INCLUSION, PARTICIPATION AND EMPOWERMENT: *Participation and empowerment of dryland agrosilvopastoral system-dependent populations in all adaptation and mitigation decision-making and implementation processes.*

Historically, dryland communities have been mostly excluded from state governance processes, leading to the perception of drylands as being unproductive, as well as undervaluing their contribution to national economies. In this context, decision-making on land and water management and mobility at the local level operates through a diverse array of customary systems, which often overlap. However, the authority of traditional customary governance systems over dryland resources has been affected by socio-economic and political changes, often due to state-level decisions. These decisions, including those related to land tenure, migration, sedentarisation

or large-scale agricultural investments, result at times in the fracture or demobilization of communities. Hence, the power of dryland people to interact with and make their voices heard by governments can be lessened. Gender equity is also of foremost importance, and needs to be recognized in all processes leading to decision-making.

Expected transformation under the social pillar

4 EQUITY

© Tara Halstead

In **Jordan**, the revival of a traditional community governance system for agrosilvopastoral land – the Hima – has allowed the restoration and sustainable use of previously degraded pastures in areas where land tenure had been transferred to the State. Pastoralists can now access better pastures, are willing to pay for water, and respect the Hima system. This is being adopted all over the country and is estimated to deliver between JOD 144 and 289 million worth of net benefits to Jordanian society. See: www.eld-initiative.org

5 DISASTER RISK MANAGEMENT

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In **Mozambique**, after two years of below average harvests, due to the worst drought in Southern Africa in 35 years, most poor households in the cereal-producing provinces of Sofala and Manica were unable to conserve grain to be used as seed for the 2019 season. Then, in March 2019, these semi-arid provinces were hit by Tropical Cyclone Idai, which destroyed agricultural fields and decreased cereal production in Mozambique to 2.8 million tonnes, about 16 percent lower than 2018. As a result, the poorest were left without seeds to plant and their dependence on humanitarian assistance increased. See: www.fao.org

6 INCLUSION, PARTICIPATION AND EMPOWERMENT

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In **Ethiopia**, in the Tigray region, which is considered the poorest region of the country, increasing the involvement of community-based organizations in the implementation of sustainable land management programmes, with climate change adaptation and co-benefits, allows the cost effectiveness of already limited national resources to be brought to scale. As a result, "millions of hectares of land have been enclosed for natural regeneration, billions of trees have been planted, a million kilometres of terraces have been constructed, hundreds of thousands of hectares of land have been protected from unlimited livestock and human intervention and thousands of water harvesting and development schemes have been developed in various parts of the country" (Thrive, CGIAR).

Environmental sustainability pillar

Dryland forests account for 18 percent of the dryland area, while barren land accounts for 28 percent, grassland 25 percent and cropland 14 percent. These lands are the source of energy, foods, medicines, fibre and income to millions of people on a regular basis and are critical for the food security of poor agrosilvopastoral communities during times of drought and hardship. In Africa alone, over 320 million people depend on dryland forests to meet many of their basic needs. See: http://www.fao.org/3/ca7148en/ca7148en.pdf

Even if global warming can be limited to a 1.5 °C increase, its impacts will nevertheless test dryland ecosystems and exacerbate land degradation. There is therefore an urgent need to balance land management interventions in drylands that ensure food production, support local livelihoods and safeguard natural resources, including water.

EXPECTED TRANSFORMATION 7 NATURAL RESOURCE USE EFFICIENCY: *Efficient use of dryland natural resources to ensure the long-term provision of ecosystem services under climate change.*

Understanding and addressing efficiency issues in both the demand for and the supply of natural resources, as well as averting irreparable trade-offs, are essential. Contributing to increasing demand efficiency are interventions leading to savings in the use of natural resources that can meet the same demands, through improved technologies or practices. In terms of supply, assessing the extent of the resources available, the limits to their sustainable extraction or use and their potential availability under climate change should be evaluated as some resources may inevitably be lost. Once again, traditional knowledge in the local communities needs to be considered to strengthen collective action, including the differentiated roles of women and men.

Beyond this knowledge, addressing the policy and institutional frameworks that govern dryland resources and action on the ground are required. In general, actions to support this expected transformation should seek to enhance efficiency in natural resource use in order to avoid land degradation.

At the policy level, land degradation neutrality policies should be considered as a good option because they also contribute to the other two expected transformations under the environmental sustainability pillar. The implementation of such policies supports farmers and communities in their efforts to avoid, reduce and even reverse land degradation, as well as promote restoration of dryland ecosystems. Thus, these policies help to strengthen the adaptive capacities of farmers and communities to better cope and recover from climate and other environmental impacts.

EXPECTED TRANSFORMATION 8 RESTORATION: *Restored degraded ecosystems and halted deforestation to reduce the impacts of climate change on land degradation processes.*

As drylands store approximately 46 percent of the global carbon share, with most of this carbon being stored in the soil, a focus on reversing soil degradation by restoration and adaptive land management practices in these regions can make a major contribution to global efforts to mitigate climate change. Adaptive land management practices include, among others, introducing productive or enriched fallow systems, increasing fallow periods, erosion control with native agroforestry species, low stocking rates with controlled grazing or excluding livestock to allow natural regeneration of dryland forests.

EXPECTED TRANSFORMATION 9 ECOSYSTEM CONSERVATION AND PROTECTION: *Conserved and protected dryland ecosystems and biodiversity to maintain ecosystem services and the subsequent sustainable and equitable provision of ecosystem goods and services under climate change.*

Maintaining ecosystem services for sustainable agrosilvopastoral production in drylands goes beyond the efficient use of natural resources and the restoration of degraded land. It requires guaranteeing that sufficiently large and healthy areas exist and are connected for species to become established, grow and

reproduce, and that gene flow is possible. Thus, this enables species greater resilience to recover from shocks.

A full range of management approaches to protected areas is found in drylands, from 'strict nature reserves' to 'protected landscapes' where conservation is integrated with traditional lifestyles such as pastoralism, and where a certain amount of grazing is often beneficial to vegetation management. They vary from government-run national parks to ancient examples of community conserved areas.

Despite having great importance for environmental, economic and social sustainability, protected areas are under immense pressure from land-use conversion, deforestation and invasive species, among other factors. Addressing these threats is imperative and requires a suite of new conservation management and governance approaches, supporting policies, information and the participation of users.

Expected transformation under the environmental pillar

7 NATURAL RESOURCE USE EFFICIENCY

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In **Senegal**, the Partnership for Action on Green Economy (PAGE) enabled the National Strategy for the Promotion of Green Jobs (2015–2020) to be set up. As a result, 2 000 green jobs, including recycling and agroforestry projects, were created by 2019, with more than 40–45 percent for women and youth groups. See: www.futurepolicy.org/

8 RESTORATION

© FAO

The **Great Green Wall** (GGW) is a large-scale initiative launched in 2007 to address the growing issue of land degradation and loss of livelihoods in the Sahel. FAO is contributing through the Action Against Desertification programme, which supports large-scale restoration for small-scale farming and research into best and resilient practices that are disseminated through stakeholders, partners and countries.
See: www.fao.org

9 ECOSYSTEM CONSERVATION AND PROTECTION

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In **India**, as an example, is the concept of payment for watershed ecosystem services (PWES) by pastoralists and farmers using informal arrangements where protected areas are established and maintained for profit in dryland agrosilvopastoral systems. PWES proposes that local communities pay for water security and other benefits according to their income. As such, farmers and pastoralists receive up to 20 percent of the investment made in conservation, from a community revolving fund fed by the 'water tax' payments. This scheme has not only reduced land degradation, but also slowly improved rural economies and the socio-economic status of dryland communities. See p. 17: www.iucn.org

Key messages for operationalizing the transformational approach to achieve thriving dryland forests and agrosilvopastoral systems

The expected transformations when combined can reinforce the connections between the economic, social and environmental pillars of sustainability. Potential benefits and trade-offs should be assessed, weighed up and managed accordingly, while taking account of traditional knowledge and gender equity. Nevertheless, the perception of benefits and trade-offs may be different for different stakeholder groups.

Because each dryland landscape is different, there are no one-size-fits-all solutions. Interventions conducted in support of a specific expected transformation in one of the three sustainability pillars can directly or indirectly co-benefit the achievement of expected transformations in the other pillars.

For the sake of sustainability, single actions can forge synergies with other ongoing processes, instead of creating trade-offs. Consequently, the transformational change requires understanding the interconnectedness of the social, economic and environmental pillars of sustainability in order to be able to assess and balance the potential implications of an action, programme or policy on the different pillars.

Sustainable forest and land management approaches can help stakeholders find synergies to implement balanced solutions. For example, these solutions can be attained by enhancing biodiversity, such as the sustainable management of trees within agricultural landscapes, which simultaneously offer positive livelihood outcomes, enabling diversification and an increase of incomes for dryland dwellers, both men and women.

Traditional, local and research-derived knowledge of the dryland agrosilvopastoral systems, and awareness of the nine key expected transformations in this approach can help stakeholders modulate their actions to create conscious synergies, thus making a greater contribution towards sustainability and reducing the risk of unintended trade-offs.

The approach promotes cooperation and partnerships between communities, government, private sector, NGOs, academia and other actors incentivised by a shared vision of the expected transformations, their benefits and an understanding of what could be lost in the process (the price to pay). Thus, when planning new or steering existing interventions in alignment with the approach, there is need for transparency, participation and indeed negotiation to agree on incentives, disincentives and discussion of the associated risks.

Champions are needed to advocate and promote the transformational change in the management of dryland agrosilvopastoral systems. Champions can facilitate the creation of a shared vision and help make sustainable innovations known. In this process, women and youth in particular should be empowered to be able to make a significant contribution and to benefit accordingly.

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